AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. – 2. (cancelled)

3. (currently amended) An image data analysis method for inspecting pads of electronic devices, the method comprising:

acquiring an image corresponding to a pad;

generating binarized image data from the image;

generating a list of dark regions from the binarized image;

selecting at least one dark region from the list of dark regions;

generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

~~The image data analysis method of claim 1 wherein the step of generating edge data further comprises:~~

positioning a geometric mask at a plurality of mask positions tangent to the edge data; ~~and~~

pruning the at least one dark region of at least a portion of ~~boundary description~~ the binarized image data not contained by the mask positions; and

computing a boundary description of the at least one dark region using the binarized image data and the edge data.

4. (original) The image data analysis method of claim 3 wherein the geometric mask is circular.

5. (original) The image data analysis method of claim 3 further comprising the application of a fuzzy threshold according to an aspect ratio of the at least one dark region for limiting the pruning step.

6. (currently amended) ~~The image data analysis method of claim 1 further~~ An image data analysis method for inspecting pads of electronic devices, the method comprising:

acquiring an image corresponding to a pad;

generating binarized image data from the image;

generating a list of dark regions from the binarized image;

selecting at least one dark region from the list of dark regions;

generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

generating a first elliptical representation of an extremal end of the at least one dark region;

generating a second elliptical representation of a subset of the edge data corresponding to a region adjacent to both sides of the extremal end of the at least one dark region;

generating a third elliptical representation of the edges used in the first and second elliptical representations; and

pruning the at least one dark region in response to a comparison of the first elliptical representation, the second elliptical representation and the third elliptical representation; and

computing a boundary description of the at least one dark region using the binarized image data and the edge data.

7. (original) The image data analysis method of claim 6 wherein the step of pruning the at least one dark region further comprises:

calculating a fit error of the first elliptical representation and a fit error of the second elliptical representation and a fit error of the third elliptical representation; and

pruning the at least one dark region using the elliptical representation having a minimum fit error.

8. – 17. (cancelled)

18. (currently amended) An image data analysis system comprising: The system of claim 17 wherein the processor further comprises a

a camera;

a machine vision processor coupled to the camera, the processor and the camera configured to acquire an image corresponding to a region of inspection;

means for generating binarized image data from the image;

means for generating a list of dark regions from the binarized image data;

means for selecting at least one dark region from the list of dark regions;

means for generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

means for heuristic refinement of the binarized image data and the edge data; and

means for computing a boundary description of the at least one dark region using the binarized image data and the edge data;

means for positioning a geometric mask at a plurality of mask positions, the mask positions tangent to the edge data in the image, image; and

a-means for pruning the at least one dark region of at least a portion of the boundary description not contained by the mask positions.

19. (original) The system of claim 18 further comprising a means for applying a fuzzy threshold according to an aspect ratio of the at least one dark region for limiting the pruning means.

20. (currently amended) An image data analysis system The system of claim 15 further comprising:

. means for acquiring an image corresponding to a region of inspection;

means for generating binarized image data from the image;

means for generating a list of dark regions from the binarized image data;

means for selecting at least one dark region from the list of dark regions;

means for generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

means for generating a first elliptical representation of an extremal end of the at least one dark region;

means for generating a second elliptical representation of a subset
of the edge data corresponding to a region adjacent to both sides of
the extremal end of the at least one dark region;

means for generating a third elliptical representation of the edges
used in the first and second elliptical representations; and

means for pruning the at least one dark region in response to a
comparison of the first elliptical representation, the second
elliptical representation and the third elliptical representation; and

means for computing a boundary description of the at least one
dark region using the binarized image data and the edge data.

21. (original) The system of claim 20 further comprising:

means for calculating a fit error of the first elliptical representation
and a fit error of the second elliptical representation and a fit error
of the third elliptical representation, and;

means for pruning the at least one dark region using the elliptical
representation having a minimum fit error.

22. – 27. (cancelled)

28. (currently amended) An image data analysis method for inspecting
scenes, the The image data analysis method of claim 27 wherein
the step of generating edge data further comprises comprising:

acquiring an image of a scene;

generating binarized image data from the image;

generating a list of dark regions from the binarized image;

selecting at least one dark region from the list of dark regions;

generating edge data by performing edge detection on a portion of
the image corresponding to the at least one dark region;

positioning a geometric mask at a plurality of mask positions
tangent to the edge data; and

pruning the at least one dark region of at least a portion of
boundary description the binarized image data not contained by the
mask positions; and

computing a boundary description of the at least one dark region
using the binarized image data and the edge data.

29. (original) The image data analysis method of claim 28 wherein the geometric mask is circular.

30. (original) The image data analysis method of claim 28 further comprising the application of a fuzzy threshold according to an aspect ratio of the at least one dark region for limiting the pruning step.

31. (currently amended) An image data analysis method for inspecting scenes, the ~~The image data analysis~~ method ~~of claim 27 further~~ comprising:

acquiring an image of a scene;

generating binarized image data from the image;

generating a list of dark regions from the binarized image;

selecting at least one dark region from the list of dark regions;

generating edge data by performing edge detection on a portion of the image corresponding to the at least one dark region;

generating a first elliptical representation of an extremal end of the at least one dark region;

generating a second elliptical representation of a subset of the edge data corresponding to a region adjacent to both sides of the extremal end of the at least one dark region;

generating a third elliptical representation using the edged from the first and second elliptical representations; and

pruning the at least one dark region in response to a comparison of the first elliptical representation, the second elliptical representation, and the third elliptical representation; and

computing a boundary description of the at least one dark region using the binarized image data and the edge data.

32. (original) The image data analysis method of claim 31 wherein the step of pruning the at least one dark region further comprises:

calculating a fit error of the first elliptical representation and a fit error of the second elliptical representation and a fit error of the third elliptical representation; and

pruning the at least one dark region using the elliptical
representation having a minimum fit error.

33. – 37. (cancelled)

UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Notice of Non-Compliant Amendment (37 CFR 1.121)

10/032,168

The amendment document filed on **1-24-05** is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121. In order for the amendment document to be compliant, correction of the following item(s) is required. Only the corrected section of the non-compliant amendment document must be resubmitted (in its entirety), e.g., the entire "Amendments to the claims" section of applicant's amendment document must be re-submitted. 37 CFR 1.121(h).

THE FOLLOWING CHECKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT

- ☐ 1. Amendments to the specification
  - ☐ A. Amended paragraph(s) do not include markings.
  - ☐ B. New paragraph(s) should not be underlined. _____
  - ☐ C. Other_____

- ☐ 2. Abstract
  - ☐ A. Not presented on a separate sheet. 37 CFR 1.72
  - ☐ B. Other_____

- ☐ 3. Amendments to the drawings _____

- ☒ 4. Amendments to the claims
  - ☐ A. A complete listing of all of the claims is not present
  - ☐ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
  - ☒ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following 7 status identifiers. (Original), (Currently amended), (Canceled), (Withdrawn), (Previously presented), (New) and (Not entered)
  - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order
  - ☒ E. Other _claims 28 and 31 do not have status identifiers_

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP Sec. 714 and the USPTO website at http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/officefiyer.pdf

If the non-compliant amendment is a PRELIMINARY AMENDMENT, applicant is given ONE MONTH from the mail date of this letter to supply the corrected section which complies with 37 CFR 1.121. Failure to comply with 37 CFR 1.121 will result in non-entry of the preliminary amendment and examination on the merits will commence without consideration of the proposed changes in the preliminary amendment(s). This notice is not an action under 35 U.S.C. 132, and this ONE MONTH time limit is not extendable.

If the non-compliant amendment is a reply to a NON-FINAL OFFICE ACTION (including a submission for an RCE), and since the amendment appears to be a bona fide attempt to be a reply (37 CFR 1.135(c)), applicant is given a TIME PERIOD of ONE MONTH from the mailing of this notice within which to re-submit the corrected section which complies with 37 CFR 1.121 in order to avoid abandonment. EXTENSIONS OF THIS TIME PERIOD ARE AVAILABLE UNDER 37 CFR 1.136(a).

If the amendment is a reply to a FINAL REJECTION, this form may be an attachment to an Advisory Action. The period for response to a final rejection continues to run from the date set in the final rejection, and is not affected by the non-compliant status of the amendment.

Patsy Zimmerman

Legal Instruments Examiner (LIE)   Telephone No

Rev 6/04